



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES

November 14, 2000

MEMORANDUM

SUBJECT: **Diazinon (057801):** Refined Anticipated Residues / Acute and Chronic Dietary Risk Assessment (Including Beef Fat). DP Barcode D269781.

FROM: Danette Drew, Chemist  
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THROUGH: David Soderberg, Chemist  
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and

Steve Knizner, Branch Senior Scientist  
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TO: Ben Chambliss, Chemical Review Manager  
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and

Danette Drew, Risk Assessor  
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**Action Requested**

In support of reregistration of diazinon, conduct chronic and acute dietary exposure assessments. Use all available data, including usage, monitoring and processing information to conduct a highly refined analyses.

This dietary exposure assessment is a revision of a previous assessment dated December 22, 1999 (S. Piper, M. Sahafeyen, W. Smith, D261399). This revision incorporates anticipated residues in cattle fat as a result of the use of cattle ear tags containing diazinon. Additionally, as in the 12/22/99 version, and at the request of SRRD, this assessment includes estimates of exposure from food commodities on which diazinon uses are not being supported by the primary registrant (Novartis) for reregistration.

## **Executive Summary**

Tier 3 refined dietary exposure assessments for both chronic and acute risk are provided in this document and its attachments.

### Chronic Dietary Exposure

The chronic population adjusted dose (cPAD) for diazinon is 0.0002 mg/kg body wt/day. The estimated chronic risks ranged from 10% of the cPAD for males 13-19 years old to 22% of the cPAD for the most highly-exposed subgroup, children 1 to 6 years old. Risk estimates for all subgroups analyzed were less than 100% of the cPAD and therefore risk estimates for all subgroups are below HED's level of concern.

An analysis of commodities contributing to the chronic dietary exposure to diazinon for the most highly exposed subgroup, children 1-6 years, indicated that beef fat was the major contributor to the exposure (about 40% of total exposure). The chronic anticipated residue for beef fat is conservative. The maximum reported residue in beef fat from cattle ear tag use at the maximum application rate was used in the dietary analysis. Also assumed was the percentage of domestic beef consumed (89%) and the weighted average domestic cattle treated with diazinon (1.5%), and the percentage of imported beef consumed (11%). It was assumed that all imported beef is treated with diazinon (100% treated). The overall percent adjustment used in the chronic analyses for beef fat was 12%. HED notes that the assumptions, especially that 100% of imported beef are treated with diazinon, are likely to be conservative and may overestimate the resultant exposures. Further refinements to the estimates of cattle treated with diazinon, domestic and imported, may further reduce dietary risk estimates.

When beef fat and sheep commodities are removed from the analyses the chronic exposures and resulting risk estimates decreased for all subpopulations (all risk estimates  $\leq$  13% of the cPAD).

A discussion of potential dietary exposure to diazinon from uses in food handling establishments is also included. It is unlikely that food handling establishment uses of diazinon will result in any residues on foods as long label directions are followed.

### Acute Dietary Exposure

The acute population adjusted dose (aPAD) for diazinon is 0.0025 mg/kg body wt/day for all subpopulations. The estimated acute risks at the 99.9th percentile of exposure ranged from 23%

of the aPAD for males 13 to 19 years old to 63% of the aPAD for the most highly-exposed subgroup, children 1 to 6 years old. Risk estimates for all subgroups analyzed were less than 100% of the acute cPAD and therefore risk estimates for all subgroups are below HED's level of concern.

An analysis of commodities contributing most highly to acute dietary exposure to diazinon indicated that beef fat and sheep commodities (fat and lean meat) were the major contributors to high exposure events in the acute analysis. It should be noted that the anticipated residues for these commodities are conservative. The maximum reported residues in sheep and beef tissues from dermal uses were used in the dietary analyses. The maximum residue value for sheep fat and sheep lean meat have been adjusted for percent of sheep consumed treated with diazinon sprays (37%). The residue values for sheep were obtained from studies where sheep were "dipped", or submerged, which is not a label use. The maximum value for beef fat was adjusted for percent beef consumed from cattle treated with ear tags (14%). However, these values are not considered to be highly refined, but were the best available. HED notes that the assumption that 100% of imported sheep and 100% of imported beef are treated with diazinon is likely to be conservative and may overestimate the resultant exposures. Further refinements to the estimates of sheep and cattle treated with diazinon, domestic and imported, may reduce dietary risk estimates.

When sheep and beef are removed from the analyses the acute exposures and resulting risk estimates decreased for all groups, most notably for children 1-6 yrs where the risk estimate at the 99.9th percentile dropped from 63 % aPAD to 47% aPAD.

### **Toxicological Information**

Diazinon is a cholinesterase inhibitor. The Health Effects Division (HED) Hazard Identification Assessment Review Committee (HIARC), has reevaluated the toxicity data base for diazinon (Diazinon - Replacement of Human Study Used in Risk Assessments - Report of the Hazard Identification Assessment Review Committee dated Sept 21, 1999 ) and established an acute Reference Dose (RfD) and a chronic RfD. The HED Food Quality Protection Act (FQPA) Safety Factor Committee has evaluated the toxicity data and exposure data (FQPA Safety Factor Recommendations for the Organophosphates, FQPA Safety Committee Report dated August 6, 1998) and determined that the 10X uncertainty (UF) factor required by FQPA can be **reduced to 1x for diazinon**.

The doses and toxicological endpoints selected for dietary exposure to diazinon are summarized below in Table 1.

Table 1. Doses and Toxicological Endpoints for Dietary Risk Assessment.

Table 1. Doses and Toxicological Endpoints for Dietary Risk Assessment.			
EXPOSURE SCENARIO	DOSE	ENDPOINT	STUDY
Acute Dietary	NOAEL=0.25 mg/kg	Plasma cholinesterase inhibition	Acute Neurotoxicity - Rat Special Study-Rat
	UF =100 FQPA=1	Acute RfD = 0.0025 mg/kg/day aPAD* = 0.0025 mg/kg/day	
Chronic Dietary	NOAEL=0.02 mg/kg/day	Consistent pattern of NOAELs observed for cholinesterase inhibition.	4 week, 90 day and 1-year studies in dog 4 week, 90 day and 2 -year studies in rat
	UF= 100 FQPA=1	Chronic RfD = 0.0002 mg/kg/day cPAD* = 0.0002 mg/kg/day	
* aPAD or cPAD = acute or chronic Population Adjusted Dose = Acute or Chronic RfD÷FQPA Safety Factor			

## Residue Information

### Reregistration background

Diazinon (O,O-diethyl O-[6-methyl-2-(1-methylethyl)-4-pyrimidinyl] phosphorothioate) is an insecticide currently registered for soil and foliar applications to various food and feed commodities. Diazinon is also registered for crack and crevice treatments in food handling establishments, for dermal applications to sheep, and for use in cattle ear tags. Diazinon is a List A FIFRA reregistration chemical that was the subject of a Reregistration Standard Guidance Document dated 12/88 and a 1992 Reregistration Standard Update; a 1996 Data Call-In (DCI) was also issued. The Residue Chemistry Chapter of the Diazinon Reregistration Eligibility Decision (RED) is being completed in conjunction with this document and reflects the evaluation of all of the submissions made in response to the earlier reregistration documents.

### Tolerances

Tolerances for diazinon residues in/on plant raw agricultural commodities (RACs), in processed food, and in animal feed are currently expressed in terms of diazinon *per se* [40 CFR §180.153]. Tolerances are also established for meat commodities of cattle and sheep to cover residues from dermal application. There are no tolerances for residues in milk, poultry or eggs.

## Residues of Concern in Dietary Exposure Assessments

The HED Metabolism Committee has determined that the residues of concern in plants and animals are diazinon, hydroxy diazinon, and diazoxon (Diazinon: Decision from the HED Metabolism Assessment Review Committee, David Hrdy, 4/17/98, D244848). The committee recommended that for enforcement purposes, diazinon, *per se* be included in the tolerance expression and that residues of diazinon and its metabolites, hydroxy diazinon and diazoxon, be considered in dietary risk assessment. Both of these metabolites are considered to be cholinesterase inhibitors. Implicit in the committee decision was the provision that metabolites would be included if they were found to be present or if their level could be reliably estimated in foods. In the current assessment no residues of metabolites were evident in any of the data with the exception of one dried fig sample from a field trial and one fresh spinach sample analyzed by PDP in 1997. With the exception of these two samples, this assessment assumed no contribution to the dietary exposure from the two metabolites.

The following discussion is provided to explain the rationale and data that support our decision to exclude the metabolites from this assessment.

### Rationale for Conducting the Current Assessment on Diazinon, *per se*

Based on a review of adequate plant metabolism studies for apples, lettuce, corn, potatoes, and green beans, no residues of the diazinon oxon or hydroxy diazinon were identified in either organic or aqueous fractions. All of the diazinon metabolites were identified as pyrimidine compounds or glucose conjugates of these compounds. Neither these metabolites or their conjugates contain the cholinesterase inhibiting moiety and are not considered to be of significant toxicological concern for cholinesterase inhibition.

A review of residue field trial data for 25 crops and approximately 2000 samples analyzed for diazinon oxon and hydroxy diazinon indicated the following: for samples treated at the equivalent of currently-labeled 1X application rates and harvested at the currently-labeled post-harvest intervals (PHIs), all samples showed non-detectable residues (<0.01 ppm) for all crops, except for celery, spinach, and peppers. Hydroxy diazinon was detected in celery after a 1X pre-plant, soil-incorporated application combined with a 1X foliar application up to the post-harvest interval (PHI). Current label rates for celery no longer include the foliar applications close to the time of harvest, but do include a pre-plant, soil-incorporated application. The new use pattern, may lower detectable residues on harvested celery. Diazinon oxon and hydroxy diazinon residues were detected in spinach at 2% and 1% of the parent compound, respectively. Hydroxy diazinon was detected in peppers at low levels above the detection limit (0.07 ppm) approximately 27% of the parent compound. Foliar application rates for peppers have been lowered 3-fold (3X) from 3.75 lbs ai/A/season to 1.25 lbs ai/A/season on current labels, and the PHI used in the study was 3 days versus the currently-labeled 5 days. The new use pattern may lower residues on peppers. The summary data for these 3 crops indicated that 1 spinach sample and 4 pepper samples contained detectable metabolite residues. It was unclear how many celery samples (1 or more) were positive for the hydroxy diazinon metabolite.

The USDA Pesticide Data Program (PDP) has surveyed pesticide residues in selected food items since 1991. Final data are available for diazinon up through 1997. In this assessment we have considered these final data, as well as, preliminary data from the years 1998 and 1999. The PDP program has reported analyses for diazinon *per se* for almost all commodities up through 1998. The preliminary 1999 data include analyses for the diazinon oxon for single servings of apples, as well as, composited samples of apples, peppers, spinach, strawberries, and tomatoes. For the 1997 data, out of 11 crops and more than 7000 samples analyzed, no detectable diazinon oxon residues were reported with the exception of 1 spinach sample that contained residues at 50% of the parent compound. Although not normally included in the analyses, an unidentified chromatogram peak was investigated on 1 spinach sample and was determined to be the oxon of diazinon. The preliminary 1998-1999 data on 5 crops (apples, peppers, spinach, strawberries, and tomatoes) show no detectable diazinon oxon residues in any of the more than 1400 samples analyzed. FDA monitoring data for diazinon and the hydroxy and oxon metabolites were considered for the years 1992 through 1998. There were no reports of detectable residues of the metabolites of diazinon for these years either in domestic or imported foods (the limit of detection for diazinon and metabolites in FDA surveillance data is assumed to be 0.003 ppm).

Although the submitted cattle ear tag studies did not analyze for hydroxy diazinon and diazoxon, these metabolites are not expected to occur in cattle fat as a result of cattle ear tag use. A 1989 literature study (Surgeoner, G.A., Sach, B., Ewing, R., Braun, H. 1989. Residues of Diazinon and Diazinon Metabolites in Meat Associated with 20% Diazinon Ear Tags, Pesticide Research Report) indicates that following the use of 2 ear tags (20% diazinon), parent diazinon was found in subcutaneous (back) and perirenal cattle fat samples at levels ranging from 0.012 ppm to 0.045 ppm at 7 to 28 days PTI. No residues of diazoxon were found in the fat samples. A metabolism study on tissues of sheep treated dermally with diazinon (MRID 41386401) showed that no residues of hydroxy diazinon and diazoxon were detected in fat. Parent diazinon was detected in the sheep fat at 10.9 ppm (L.Cheng, D223286, 5/22/97).

Based on the above information, residues for hydroxy diazinon and diazinon oxon were assumed to be zero in the dietary assessment unless residues were reported. The preponderance of residue data from metabolism studies, residue field trials and monitoring data (USDA PDP and FDA Surveillance Monitoring data) indicate that these two metabolites are infrequently to never detected for the majority of crops analyzed for diazinon oxon and hydroxy diazinon. If there is a concern regarding how the metabolites were handled in the dietary assessments, HED could revise the current dietary assessments to include the residues of these compounds where warranted on a crop-specific basis, but there appears to be no cogent rationale for including these metabolites in all crops at some default value in light of the available residue data. HED does not recommend assuming  $\frac{1}{2}$  the limit of detection values for both metabolites across all crops. HED believes this would result in an overly conservative assessment driven by these values because of the relatively low levels of diazinon, *per se*.

### Sources of Residue Data

The anticipated residues in this assessment are based on the following sources, in order of preference: USDA PDP monitoring data, FDA surveillance monitoring data, and controlled field trial data. The monitoring data are preferred over field trial data because samples are more reflective of residues that may occur on foods as consumed. The PDP data are preferred because, in general, more samples are taken and the sampling protocols have been designed to reflect variations in consumption patterns throughout the year and geographically. PDP samples include both domestic and imported foods. There were no “market basket” data available for diazinon.

The USDA Pesticide Data Program (PDP) has surveyed pesticide residues in selected food items since 1991. Data are publically available for diazinon up through 1997. In this assessment we have considered these data as well as preliminary data from the years 1998 and 1999. The PDP program has reported analyses for diazinon *per se* for all commodities except for a single serving study on apples conducted in 1999. The oxygen analog was included in analyses for this commodity but no detectable residues were reported.

FDA monitoring data for diazinon and the 2 metabolites of concern were considered for the years 1992 through 1998. There were no reports of detectable residues of the metabolites of diazinon for these years. Data were combined for all years and included only domestic surveillance data unless otherwise noted. Results from monitoring data are not generally used unless at least 100 samples have been analyzed. The limits of detection are not reported individually for each pesticide/commodity pair so an assumption is made based on knowledge of the sensitivity of multiresidue methods used and the lowest values reported for detectable samples. For purposes of this assessment the limit of detection for diazinon and metabolites is assumed to be 0.003 ppm.

In several cases (see Table 2) monitoring data were translated to similar commodities in accordance with guidance found in HED SOP 99.3 for Translation of Monitoring Data (March 26, 1999). For those cases in which field trial data were used the anticipated residues were based on the maximum supported use patterns, as summarized in the Residue Chemistry Chapter of the RED. If neither adequate monitoring data nor information on supported use patterns were available then residues were assumed to be at the tolerance level.

**Table 2. Diazinon: Translation of Pesticide Monitoring Data.**

Commodity Analyzed	Source of Data	Commodity Translated to
Peach	PDP	Apricot, Nectarine
Spinach	PDP	Garden Beet tops, Turnip tops, Parsley, Dandelion
Blackberry/Raspberry	FDA	Other Caneberries
Orange	PDP	Other Citrus
Orange Juice	PDP	Other Citrus Juice
Carrots	PDP	Parsnip, Rutabaga, Turnip root, Ginseng
Garden Beet Roots	FDA	Sugar Beets
Celery	PDP	Swiss Chard
Collards, Kale, Mustard Greens combined	FDA	Combined residue data used
Lettuce	PDP	Radicchio
Bok choy	FDA	Chinese broccoli
Broccoli	FDA	Brussels sprouts
Cauliflower	FDA	Kohlrabi
Green Onions	FDA	Leeks
Bulb Onions	FDA	Shallots, Garlic
Green Peppers	FDA	Other peppers, Hot Peppers
Cantaloupe	FDA	Casaba, Crenshaw, Honeydew, Persian Melon, Balsam Pear, Bitter Melon, Wintermelon
Green Beans	PDP	All Succulent Beans, Succulent Blackeyed Peas
Bananas	PDP	Plantain
Radish and Oriental Radish combined	FDA	Oriental Radish
Wheat Grain	PDP	Sorghum

**Percent Crop Treated Data**

A quantitative usage analysis for diazinon was provided by BEAD based on data years 1987-96 (Alan Halvorson, QUA date: January 29, 1999 and October 6, 2000) and is included as Attachment 1 to this document. Data sources included USDA/NASS (1990-97), California EPA



Department of Pesticide Regulation (1993-95), National Center for Food and Agricultural Policy, various proprietary data sources (1987-97) and the USDA's Foreign Agricultural Service website (<http://www.fas.usda.gov/dlp/beef/Beefpage.htm>). The weighted average of percent crop treated was used for estimating chronic dietary exposure and an estimated maximum percent crop treated was used for estimating acute dietary exposure. Percent crop treated information was used either as a predictor of the probability of residues occurring on a given monitoring sample or, in the case of blended commodities and for chronic exposure, as an adjustment factor to the average residue occurring in a commodity. For some of the PDP commodities, imported samples comprise a significant portion of the database. In those cases the percent crop treated information provided by BEAD was adjusted to account for imports. The assumption was made for imports that 100% of the crop had been treated.

### Processing Factors

All processing factors used in this assessment are summarized in Table 3. These factors are input into the DEEM software as adjustment factor #1 (see attached printouts of DEEM inputs).

**Table 3. Diazinon Processing Factors Summary**

Category	Processing Factor used for current analysis	Data Sources	Comments and Agency Reviews
Apples-dried	8	DEEM Default	
Apples-juice/cider	1		Monitoring data used for juice
Apples-juice-concentrate	3	Ratio of Default factors for juice & concentrate	Conc. factor applied to juice data
Apricots-dried	6	DEEM Default	
Bananas-dried	3.9	DEEM Default	
Cherries-dried	4	DEEM Default	
Cherries-juice	1.5	DEEM Default	
Cottonseed meal	0.44	MRID 00032881	S. Funk, 4/17/92 used average factor from all studies with detectable residues
Cottonseed Oil	2.2	MRID 00032881	S. Funk, 4/17/92 used average factor from all studies with detectable residues
Cranberries-juice	1.1	DEEM Default	
Cranberries-juice-concentrate	3.3	DEEM Default	
Grapefruit-juice	1		Used orange juice monitoring data
Grapefruit-juice-concentrate	3.9	Ratio of Default factors for juice & concentrate	Factor applied to orange juice monitoring data

Category	Processing Factor used for current analysis	Data Sources	Comments and Agency Reviews
Grapes-juice	1	MRID 41410001	A factor of 0.02 for juice had been demonstrated S. Funk, 4/17/92 Don't use factor because juice data are available
Grapes-juice-concentrate	3	Ratio of Default factors for juice & concentrate	
Grapes-raisins	0.13	MRID 41410001	S. Funk, 4/17/92 used average factor from all studies with detectable residues
Lemons-juice	1		Used orange juice monitoring data
Lemons-juice-concentrate	5.7	Ratio of Default factors for juice & concentrate	Factor applied to orange juice monitoring data
Limes-juice	1		Used orange juice monitoring data
Limes-juice-concentrate	3	Ratio of Default factors for juice & concentrate	Factor applied to orange juice monitoring data
Onions-dehydrated or dried	9	DEEM Default	
Oranges-juice	1		Used orange juice monitoring data
Oranges-juice-concentrate	3.7	Ratio of Default factors for juice & concentrate	Factor applied to orange juice monitoring data
Peaches-dried	7	DEEM Default	
Pears-dried	6.25	DEEM Default	
Pineapples-dried	5	DEEM Default	
Pineapples-juice	0.12	MRID 42179501	P. Deschamp, 6/3/92, D174774
Pineapples-juice-concentrate	0.44	MRID 42179501	(juice factor) X (ratio of DEEM defaults for juice & concentrate)
Plantains-dried	3.9	DEEM Default	
Plums/prunes-juice	1.4	DEEM Default	
Plums/prunes-dried	0.6	MRID 43274401	S. Funk, 5/24/93, D189573
Potatoes/white-dry	6.5	DEEM Default	
Sugar-beet-molasses	0.5	MRID 41336514	Diazinon Reg. Std. Update, 1/24/92
Tangerines-juice	1		Used orange juice monitoring data

Category	Processing Factor used for current analysis	Data Sources	Comments and Agency Reviews
Tangerines-juice-concentrate	3.2	Ratio of Default factors for juice & concentrate	Factor applied to orange juice monitoring data
Tomatoes-catsup	0.30	MRID 41336508	S. Funk, 4/17/92 used average factor from all studies with detectable residues
Tomatoes-dried	14.3	DEEM Default	
Tomatoes-juice	0.05	MRID 41336508	S. Funk, 4/17/92 used average factor from all studies with detectable residues
Tomatoes-paste	0.60	MRID 41336508	S. Funk, 4/17/92 used average factor from all studies with detectable residues
Tomatoes-puree	0.70	MRID 41336508	S. Funk, 4/17/92 used average factor from all studies with detectable residues

#### Dietary exposure assessment

The following commodities, for which all uses have been canceled and tolerance revocations have been initiated, are not included in the current assessment:

- olives
- peanuts
- pecans
- soybeans
- sugarcane
- beans, guar
- cowpeas

The potential for transfer of residues to meat, milk, poultry and eggs from animal feeds has been reassessed. It has been determined that the criteria exist for a category 3 situation as described in 40 CFR 180.6(a), i.e., no tolerance is needed because there is no reasonable expectation of finite residues to occur in these commodities except in cattle fat as a result of cattle ear tag use and in all sheep tissues as a result of dermal treatments. Dermal treatments are not being supported for poultry or lactating dairy. Therefore, the following commodities are not included in the current assessment:

- milk

- all poultry meats and meat byproducts
- eggs
- all livestock meat and meat byproducts excluding beef fat and the meat, fat, and meat byproducts of sheep

Uses of diazinon on the following crops are not being supported by the registrant although tolerances exist; however, SRRD has requested that they be included in the present assessment pending a determination of whether any other interested party wishes to support them.

- banana
- citrus fruits
- coffee
- cotton
- filberts (supported by IR-4)
- kiwi fruits (imported fruit is being supported)
- sorghum

Tolerance level residues were assumed to be present in coffee and cottonseed. The registrant is not supporting uses on alfalfa but tolerances are established for forage (40 ppm) and hay (10 ppm). The only alfalfa food commodity is alfalfa sprouts. This commodity is not being considered in the present assessment because, in our judgement, there is little likelihood for use of diazinon on alfalfa seeds grown for sprouts or from dietary exposure to diazinon via consumption of sprouts.

Anticipated residues were derived in accordance with established Agency policies and guidance for chronic and acute dietary exposure assessments. Chronic residues are generally based on the mean of the best available residue data with appropriate adjustments for percent crop treated and residue concentration/reduction from processing. Acute anticipated residues were derived using guidance provided in HED SOP 99.6 (Classification of Food Forms with Respect to Level of Blending (8/20/99)). Each food form entered in the DEEM software for dietary exposure assessments is classified as being blended (B), partially blended (PB), or not blended (NB). As more extensively described in the SOP, PDP and FDA monitoring data, which are generally based on composite samples, may be used to construct residue distributions for input into a Monte Carlo analysis using the DEEM software. If foods are blended (B or PB) the entire distribution of monitoring data can be used to represent a distribution. If the foods are classified as not blended (NB) then further evaluation of PDP and FDA data are required before compiling a residue distribution. The composited samples from PDP and FDA (5- to 20 lbs) may not reflect residue levels in single servings of commodities that are not blended. Thus, these monitoring data should be "decomposed" via a suitable statistical procedure in order to simulate a distribution of single serving commodities. In the current analysis we are using a procedure developed by HED (Allender, H. "Use of the Pesticide Data Program (PDP) in Acute Dietary Assessment," EPA interim guidelines, August 1998). This decomposing procedure requires that the available monitoring data contain at least 30 detects. If fewer than 30 detects occur then a judgement is made as to whether the composite data set may be used either directly or with an appropriate

multiplication factor. These considerations are also discussed at length in the SOP 99.6.

In the current assessment we have applied certain assumptions to using the available composite monitoring data for foods that are not blended. For the most part these assumptions are derived from HED standard procedures and guidance but some individual judgements have been incorporated. The criteria and assumptions are as follows:

- If monitoring data for a not-blended food contain enough detectable residues (~30 or more), then the data are decomposited with the Allender method. This method produces a lognormal distribution of residue values that is used in a Monte Carlo analysis.
- The lognormal distribution obtained by the Allender method is truncated at the tolerance level for the commodity of interest. Although tolerances are also based on composite samples, these are from controlled field trials in which it is assumed that all components of the composite have been treated with the maximum allowable level of diazinon. Therefore, it is assumed that the tolerance, which is based on a rounded up maximum residue value from field trials, would not be exceeded in single servings if good agricultural practices are followed.
- If significantly fewer than 30 detectable residues occur in the monitoring data then the Allender method is not used. If the monitoring data contain very low residues then they are used directly with the assumption that residue levels could not be underestimated significantly. If some of the residues are significantly higher than the LOD of the analytical method then a multiplication factor is applied to the detected residues as a conservative simulation of residues that may occur in single servings within a given composite sample. This factor is derived as follows: The tolerance for the commodity of interest is divided by the highest residue level reported. All detects for that commodity are multiplied by this factor and the adjusted data are used directly to construct a residue distribution for Monte Carlo analysis.

### **ESTIMATION OF ANTICIPATED RESIDUES FOR INDIVIDUAL FOODS**

The inputs for acute and chronic exposure for each food commodity are described in Tables 4 and 5 and in the following sections. In some cases it may be necessary to see attachments to this document for actual numeric inputs to the DEEM™ software.

**Table 4. Summary of Source Data and DEEM™ Inputs for Acute Dietary Exposure Assessment**

Commodity	Designation <sup>1</sup>	%CT <sup>2</sup> (max)	SUMMARY OF DATA <sup>4</sup>						RDF	POINT ESTIMATE (ppm)
			commodity/source/yr	Total	Importe d	Detec ts	Range (det)	½ LOD (avg)		
almond	PB	30	field trial data	23	0	8	< 0.01	---	3 / 0 / 7	
apples	NB	10	apples/PDP/93-96	2554	118	32	0.003-0.33	0.002614	992 / 6925 / 71257	
apples	PB	10	apples/PDP/93-96	2554	118	32	0.003-0.33	0.002614	32 / 223 / 2299	
apples	B	na	apples/PDP/93-96	2554	118	32	0.003-0.33	0.002614	32 / 2522 / 0	
apples-juice	PB	33	apple juice/PDP/96-98	1554	448	0	na	0.002549	0 / 33 / 67	
apricot	NB	79	peach-fresh/PDP/94-96	1087	366	65	0.003-0.16	0.003269	998 / 6846 / 2085	
apricot	PB	68	peach-can/PDP/97	754	11	0	na	0.00347	0 / 68 / 32	
apricot	B	na	peach-fresh/PDP/97	1087	366	65	0.003-0.16	0.003269	65 / 1022 / 0	
banana	NB/PB/B	100	banana/PDP/94-95	640	640	0	na	0.0028	na	0.0028
beef-fat, veal-fat	na	14	cattle ear tag studies							0.39
beets-garden-roots	NB/PB	53	beets-garden-roots/FDA/92-97	166	0	0	na	0.0015	0 / 53 / 47	
beets-garden-tops	PB	53	spinach-fresh/PDP/95-97	1638	46	41	0.003-0.45	0.003645	40 / 680 / 638	
black berry/black berry juice	PB	23	black berry + raspberry/FDA/92-98	192	0	3	0.0005-0.033	0.0015	3 / 41 / 148	
blueberries	PB	11	blueberries/FDA/92-98	247	0	0	na	0.0015	0 / 11 / 89	
bok choy	PB	100	bok choy/FDA/92-98	98	0	2	0.04-0.1	0.0015	2 / 96 / 0	
broccoli	NB/PB	21	broccoli/PDP/94	634	15	0	na	0.0028	0 / 21 / 79	
Brussels sprouts	PB	100	broccoli/PDP/94	634	15	0	na	0.0028	na	0.0028
cabbage	NB	17	cabbage/FDA/92-98	532	0	1	0.33	0.0015	1 / 89 / 442	
cabbage	PB	31	cabbage/FDA/92-98	532	0	1	0.11	0.0015	1 / 164 / 367	
cabbage-savoy	NB	17	cabbage/FDA/92-98	532	0	1	0.33	0.0015	1 / 89 / 442	
cantaloupe	NB/PB	18	cantaloupe/FDA/92-98	414	0	3	0.02-0.03	0.0015	3 / 72 / 339	
carrots	NB	20	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	998 / 4541 / 22156	
carrots	PB	20	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	68 / 309 / 1510	
cauliflower	NB/PB	31	cauliflower/FDA/92-98	269	0	0	na	0.0015	0 / 31 / 69	
celery	NB	15	celery/PDP/93-94	810	15	69	0.005-0.3	0.0028	997 / 759 / 9948	
celery	PB	15	celery/PDP/93-94	810	15	69	0.005-0.3	0.0028	69 / 52 / 688	
cherries	PB	29	cherries/FDA/92-98	445	0	29	0.0015-0.06	0.0015	29 / 100 / 316	

Commodity	Designation <sup>1</sup>	%CT <sup>2</sup> (max)	SUMMARY OF DATA <sup>4</sup>						RDF	POINT ESTIMATE (ppm)
			commodity/source/hrs	Total	Importe d	Detect ts	Range (det)	½ LOD (avg)	Det / ½ LOD / zeros	
coffee	B	100	tolerance for coffee bean	na	na	na	na	na	na	0.2
collard	PB	28	collards+kale+mustard green/FDA	355	0	7	0.005-0.83	0.0015	7 / 92 / 256	
cottonseed	B	1	tolerance for cottonseed	na	na	na	na	na	na	0.002
cranberries	PB	73	field trial data	na	na	8	0.03-0.19	---	8 / 0 / 3	
cucumber	NB	7	cucumbers/FDA/92-98	451	0	1	0.088	0.0015	1 / 31 / 419	
cucumber	PB (proc)	12	cucumbers/FDA/92-98	451	0	1	0.088	0.0015	1 / 53 / 397	
dandelion-green	PB	100	spinach/PDP/95-97	1638	46	41	0.003-0.45	0.003645	40 / 680 / 0	
endives-escarole	PB	100	endives-escarole/FDA/92-98	144	0	4	0.02-0.16	0.0015	4 / 140 / 0	
figs	NB	26	field trial data	na	na	6	0.17-0.39	---	6 / 0 / 17	
filberts	PB	12	field trial data	na	na	---	0.003-0.01	0.003-0.01	4 / 0 / 29	
garlic	NB/PB	11	dry-bulb onions/FDA/92-98	248	0	2	0.005-0.01	0.0015	2 / 38 / 324	
ginseng	PB	100	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	68 / 309 / 0	
grape juice	PB	7	grape-juice/PDP/98	665	41	0	na	0.002647	0 / 7 / 93	
grapefruit	NB	4	oranges/PDP/94-96	1892	23	0	na	0.003091	0 / 4 / 96	
grapefruit juice	PB	40	orange juice/PDP/97-98	1392	532	0	na	0.003684	0 / 40 / 60	
grapefruit peel	PB	4	citrus tolerance (0.7 ppm)	---	---	---	---	---	4 / 0 / 96	
grapes	PB	52	grapes/PDP/94-96	1884	912	29	0.005-0.15	0.002592	29 / 951 / 904	
green beans-canned	PB	8	green beans-canned/PDP/96-98	854	---	0	---	0.0027	0 / 26 / 828	
green beans-fresh	PB	3	green beans-fresh/PDP/94-95	1178	---	5	0.005-1.1	0.0033	5 / 30 / 1143	
green beans-frozen	PB	8	green beans-frozen/PDP/96-98	743	---	11	0.003-0.019	0.0026	11 / 22 / 721	
honeydew	NB/PB	10	cantaloupe/FDA/92-98	414	0	3	0.02-0.03	0.0015	3 / 38 / 373	
hops	B	---	field trial data	na	na	30	<0.05-0.49	---	na	0.096
kale	PB	1	collards+kale+mustard green/FDA	355	0	7	0.005-0.83	0.0015	7 / 0 / 693	
kiwi fruit	NB/PB	100	kiwi fruit/FDA/92-98	128	0	0	na	0.0015	na	0.0015
kohlrabi	NB	100	cauliflower/FDA/92-98	269	0	0	na	0.0015	na	0.0015
lemon/lime peel	PB	1	citrus tolerance (0.7 ppm)	---	---	---	---	---	1 / 0 / 99	
lettuce-head	NB	39	lettuce/PDP/94	691	2	27	0.005-0.16	0.002478	998 / 8963 / 15580	
lettuce-leafy	PB	68	lettuce/PDP/94	691	2	27	0.005-0.16	0.002478	27 / 443 / 221	
lettuce-unspecified	PB	52	lettuce/PDP/94	691	2	27	0.005-0.16	0.002478	27 / 332 / 332	
mushrooms	PB	100	field trial data	na	na	13	0.07-0.17	---	13 / 0 / 0	
mustard green	PB	39	collards+kale+mustard green/FDA	355	0	7	0.005-0.83	0.0015	7 / 131 / 216	
nectarines	NB	100	peach-fresh/PDP/94-96	1087	366	65	0.003-0.16	0.003269	997 / 6847 / 0	

Commodity	Designation <sup>1</sup>	%CT <sup>2</sup> (max)	SUMMARY OF DATA <sup>4</sup>						RDF	POINT ESTIMATE (ppm)
			commodity/source/ yrs	Total	Importe d	Detec ts	Range (det)	½ LOD (avg)	Det / ½ LOD / zeros	
onions-dry	B	na	dry-bulb onions/FDA/92-98	248	0	2	0.005-0.01	0.0015	2 / 38 / 208	
onions-dry	NB/PB	16	dry-bulb onions/FDA/92-98	248	0	2	0.005-0.01	0.0015	2 / 38 / 208	
onions-green	NB/PB	23	green onions/FDA/92-98	100	0	0	na	0.0015	0 / 23 / 77	
orange-juice	PB	40	orange-juice/PDP/97-98	1392	532	0	na	0.003684	0 / 40 / 60	
oranges	NB/PB	3	oranges/PDP/94-96	1892	23	0	na	0.003091	0 / 3 / 97	
orange peel	PB	3	citrus tolerance (0.7 ppm)	---	---	---	---	---	3 / 0 / 97	
other cane berries <sup>5</sup>	PB	45	blackberry + raspberry/FDA/92-98	192	0	3	0.0005-0.033	0.0015	3 / 83 / 106	
other citrus <sup>6</sup>	NB/PB	1	orange/PDP/94-96	1892	23	0	na	0.003091	0 / 1 / 99	
parsley	PB	8	spinach/PDP/95-97	1638	46	41	0.003-0.45	0.003645	40 / 680 / 8280	
parsnips	NB	100	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	996 / 4543 / 0	
peach	NB	47	peach-fresh/PDP/94-96	1087	366	65	0.003-0.16	0.003269	998 / 6846 / 8846	
peach	PB	20	peach-can/PDP/97	754	11	0	na	0.003471	0 / 20 / 80	
peach-dried	B	na	peach-fresh/PDP/94-96	1087	366	65	0.003-0.16	0.003269	65 / 1022 / 0	
pear	NB	24	pear, single-serving/PDP/7-98--6-99	645	43	6	0.003-0.084	0.003	6 / 149 / 490	
pear	PB	31	pear/PDP/96-98	1420	217	37	0.003-0.094	0.003	37 / 403 / 980	
pear	B	na	pear/PDP/96-98	1420	217	37	0.003-0.094	0.003	37 / 1383 / 0	
pepper-chilli, jalapeno	NB	1	green pepper/FDA/92-98	83	0	8	0.005-0.251	0.0015	8 / 0 / 792	
pepper-chilli, jalapeno	PB	1	green pepper/FDA/92-98	83	0	8	0.005-0.251	0.0015	8 / 0 / 792	
pepper-green	NB	19	green pepper/FDA/92-98	397	0	8	0.01-0.05	0.0015	8 / 67 / 322	
pepper-green	PB	19	green pepper/FDA/92-98	397	0	8	0.01-0.5	0.0015	8 / 67 / 322	
pineapples	NB/PB	100	field trial data	na	na	15	0.011-0.082	---	15 / 0 / 0	
pineapples	B	na	---	na	na	na	na	---	na	0.035
plums	NB	54	plums/FDA/92-98	112	0	0	na	0.0015	0 / 54 / 46	
potato	NB/PB	1	potatoes/PDP/94-95	1401	---	0	na	0.0023	0 / 14 / 1387	
potato	B	1	potatoes/PDP/94-95	1401	---	0	-----	0.0023	na	0.000023
radicchio	NB	100	lettuce/PDP/94	691	2	27	0.005-0.16	0.002478	998 / 8963 / 0	
radishes-oriental	NB	100	radish-oriental/FDA/92-98	142	---	1	0.038	0.0015	1 / 141 / 0	
radishes-roots	PB	7	radish-root/FDA/92-98	121	0	1	0.038	0.0015	1 / 7 / 113	
raspberry	PB	45	raspberry/FDA/92-98	139	0	2	0.005-0.033	0.0015	2 / 60 / 77	
rutabagas	NB	100	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	998 / 4541 / 0	
sheep-fat	na	37	dermal treatment studies							2.2



Commodity	Designation <sup>2</sup>	%CT <sup>3</sup> (max)	SUMMARY OF DATA <sup>4</sup>						RDF	POINT ESTIMATE (ppm)
			commodity/source/ysrs	Total	Importe d	Detec ts	Range (det)	½ LOD (avg)	Det / ½ LOD / zeros	
sheep-kidney	na	37	dermal treatment studies							0.45
sheep-lean	na	37	dermal treatment studies							0.13
sheep-liver	na	37	dermal treatment studies							0.005
sheep-meat byproducts	na	37	dermal treatment studies							0.45
sheep-other organ meats	na	37	dermal treatment studies							0.45
sorghum	B	1	wheat/PDP/95-97	1563	---	24	---	0.0032	24 / 1539 / 0	
spinach-can	PB	60	spinach-can/PDP/97-98	863	1	0	na	0.003978	0 / 60 / 40	
spinach-fresh	PB	44	spinach-fresh/PDP/95-97	1638	46	41	0.003-0.45	0.003645	40 / 680 / 918	
squash-summer	NB	9	summer squash/FDA/92-98	514	0	1	0.11	0.0015	1 / 45 / 468	
squash-summer	PB	9	summer squash/FDA/92-98	514	0	1	0.11	0.0015	1 / 45 / 468	
squash-winter	NB	42	winter squash/PDP/97-98	969	349	2	0.003-0.007	0.0025	2 / 405 / 562	
strawberries	PB	16	strawberries/PDP/98	610	-----	9	0.003-0.03	0.0034	9 / 89 / 512	
sugar beets	B	na	beets-garden-roots/FDA/92-97	166	0	0	na	0.0015	na	0.0015
sugar beets molasses	B	6	beets-garden-roots/FDA/92-97	166	0	0	na	0.0015	na	0.00009
sweet corn	NB/PB	13	sweet corn/FDA/92-98	793	0	3	0.005-0.049	0.0015	3 / 100 / 690	
sweet corn-canned	PB	13	sweet corn-can/PDP/94-96	652	0	0	---	0.0021	0 / 85 / 567	
sweet corn-frozen	PB	13	sweet corn-frozen/PDP/94-96	653	0	0	---	0.0021	0 / 83 / 552	
sweet peas-canned	PB	8	sweet peas-fresh/FDA/94-96	746	0	0	----	0.0026	0 / 37 / 709	
sweet peas-fresh	PB	8	sweet peas-fresh/FDA/92-98	540	0	13	0.01-0.81	0.0015	13 / 30 / 497	
sweet peas-frozen	PB	8	sweet peas-frozen/PDP/94-96	703	---	10	0.005-0.049	0.0025	10 / 25 / 668	
sweet potato	NB/PB	13	sweet potato/PDP/96-98	1558	---	3	-----	0.0023	3 / 200 / 1355	
Swiss chard	NB	100	celery/PDP/93-94	810	15	64	0.005-0.3	0.0028	997 / 759 / 0	
tomato	NB	38	tomato/PDP/96-98	1597	----	10	0.025-0.75	0.0026	10 / 597 / 990	
tomato	PB	38	tomato/PDP/96-98	1597	----	10	0.003-0.09	0.0026	10 / 597 / 990	
tomato	B (not proc)	na	tomato/PDP/96-98	1597	----	10	0.003-0.09	0.0026	10 / 1587 / 0	
tomato	PB (proc)	21	tomato/PDP/96-98	1597	----	10	0.003-0.09	0.0026	10 / 325 / 1262	0.000637
turnip-roots	NB	100	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	996 / 4543 / 0	
turnip-tops	PB	100	spinach-fresh/PDP/95-97	1638	46	41	0.003-0.45	0.003645	40 / 680 / 0	
walnuts	PB	14	field trial data	na	na	---	<0.01	0.005	na	0.0007
watercress	PB	100	field trial data	na	na	1	0.025	---	na	0.025
watermelon	NB/PB	5	watermelon/FDA/92-98	415	0	1	0.002	0.0015	1 / 20 / 394	

1. DEEM inputs for acute analysis were either residue distribution files (RDFs) or a point estimate. Each commodity, the assumptions and detailed procedures for estimation of inputs is listed in the following sections, according to crop groups.

2. For purposes of acute dietary exposure assessment: B=blended, PB=partially blended, NB=not blended; proc=processed

3. Percent crop treated (%CT) is based on the maximum estimated %CT as reported in the attached BEAD report of 1/29/99. For those instances in which the source data contained a significant contribution of imported samples, the %CT was adjusted by assuming that 100% of all imported samples had been treated. If usage data were not available for a crop, then 100%CT was assumed. If less than 1%CT was reported, then a minimum of 1%CT was assumed.

4. Total=total samples reported; Imports=number of imported samples reported; Detects=number of samples containing residues of diazinon greater than the appropriate limit of detection of the analysis;  $\frac{1}{2}$  LOD= the average of  $\frac{1}{2}$  the limits of detection for samples analyzed, which is an estimate of residue level in samples assumed to originate from crops that have been treated with diazinon, but with nondetectable residues.

5. Other caneberries include boysenberries, dewberries, loganberries, and youngberries.

6. Other citrus include lemons, limes, tangerines, tangelos, kumquats, and citron.

**Table 5 - Summary of Source Dta and DEEM™ Inputs for Chronic Dietary Exposure Assessment**

Commodity	%CT <sup>2</sup> (Avg)	SUMMARY OF DATA <sup>1</sup>						Point Estimate (PPM)
		commodity/source/hrs	Total	Imp	Det	Range (det)	½ LOD (avg)	Chronic
almond	20	field trial data	23	0	8	< 0.01	---	0.001
apples	4	apples/PDP/93-96	2554	118	32	0.003-0.33	0.002614	0.000542
apples-juice	32	apple juice/PDP/96-98	1554	448	0	na	0.002549	0.000816
apricot (foods derived from fresh fruit)	68	peach-fresh/PDP/94-96	1087	366	65	0.003-0.16	0.003269	0.003371
apricot (canned)	52	peach-can/PDP/97	754	11	0	na	0.00347	0.00181
banana	100	banana/PDP/94-95	640	640	0	0	0.0028	0.0028
beef-fat, veal-fat	14	cattle ear tag studies						0.39
beets-garden-roots	35	beets-garden-roots/FDA/92-97	166	0	0	na	0.0015	0.000525
beets-garden-tops	35	spinach-fresh/PDP/95-97	1638	46	41	0.003-0.45	0.003645	0.00287
blackberry/blackberry juice	18	blackberry+ raspberry/FDA/92-98	192	0	3	0.0005-0.033	0.0015	0.000205
blueberries	6	blueberries/FDA/92-98	247	0	0	na	0.0015	0.00009
bok choy	100	bok choy/FDA/92-98	98	0	2	0.04-0.1	0.0015	0.0029
broccoli	11	broccoli/PDP/94	634	15	0	na	0.0028	0.00031
Brussels sprouts	90	broccoli/PDP/94	634	15	0	na	0.0028	0.0025
cabbage (fresh)	11	cabbage/FDA/92-98	532	0	1	0.33	0.0015	0.00037
cabbage (processed)	13	cabbage/FDA/92-98	532	0	1	0.33	0.0015	0.0004
cabbage-savoy	11	cabbage/FDA/92-98	532	0	1	0.33	0.0015	0.00037
cantaloupe (Persian melon, casabas, crenshaws, balsam pear, bittermelon, & wintermelon)	12	cantaloupe/FDA/92-98	414	0	3	0.02-0.03	0.0015	0.00034
carrots	10	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	0.00065
cauliflower	16	cauliflower/FDA/92-98	269	0	0	na	0.0015	0.00024
celery	10	celery/PDP/93-94	810	15	69	0.005-0.3	0.0028	0.00417
cherries (fruit & juice)	17	cherries/FDA/92-98	445	0	29	0.0015-0.06	0.0015	0.00105
coffee	100	tolerance for coffee bean	na	na	na	na	na	0.2
collard	19	collards+kale+mustard green/ FDA92-98	355	0	7	0.005-0.83	0.0015	0.00439

Commodity	%CT <sup>2</sup> (Avg)	SUMMARY OF DATA <sup>1</sup>						Point Estimate (PPM)
		commodity/source/ yrs	Total	Imp	Det	Range (det)	½ LOD (avg)	Chronic
cottonseed	1	tolerance for cottonseed	na	na	na	na	na	0.002
cranberries	48	field trial data	8	na	8	0.03-0.19	---	0.0435
cucumber(uncooked)	4	cucumbers/FDA/92-98	451	0	1	0.088	0.0015	0.00025
cucumber (canned)	5	cucumbers/FDA/92-98	451	0	1	0.088	0.0015	0.00027
dandelion-green	100	spinach/PDP/95-97	1638	46	41	0.003-0.45	0.003645	0.008215
endives-escarole	100	endives-escarole/FDA/92-98	144	0	4	0.02-0.16	0.0015	0.00361
figs	17	field trial data	na	na	6	0.17-0.39	---	0.048
filberts	6	field trial data	4	na	---	0.003-0.01	0.003-0.01	0.00044
garlic	8	dry-bulb onions/FDA/92-98	248	0	2	0.005-0.01	0.0015	0.00016
ginseng	100	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	0.00591
grapes	50	grapes/PDP/94-96	1884	912	29	0.005-0.15	0.0001	0.001579
grape juice	3	grape-juice/PDP/98	665	41	0	na	0.002647	0.0000794
grapefruit	2	oranges/PDP/94-96	1892	23	0	na	0.003091	0.000062
grapefruit juice	39	orange juice/PDP/97-98	1392	532	0	na	0.003684	0.001437
grapefruit peel	2	used citrus tolerance (0.7 ppm)	--	--	--	--	--	0.0014
green beans (canned)	1	green beans-canned/PDP/96-98	854	---	0	---	0.0001	0.0001
green beans (fresh)	4	green beans-fresh/PDP/94-95	1178	---	5	0.005-1.1	0.0012	0.0012
green beans (frozen)	4	green beans-frozen/PDP/96-98	743	---	11	0.003-0.019	0.0002	0.0002
honeydew	5	cantaloupe/FDA/92-98	414	0	3	0.02-0.03	0.0015	0.00023
hops	63	field trial data	30	na	16	<0.05-0.49	0.025	0.072
kale	20	collards+kale+mustard green/ FDA/92-98	355	0	7	0.005-0.83	0.0015	0.00441
kiwi fruit	100	kiwi fruit/FDA/92-98	128	0	0	na	0.0015	0.0015
kohlrabi	100	cauliflower/FDA/92-98	269	0	0	na	0.0015	0.0015
lettuce-head	28	lettuce/PDP/94	691	2	27	0.005-0.16	0.002478	0.00126
lettuce-leafy	45	lettuce/PDP/94	691	2	27	0.005-0.16	0.002478	0.00168
lettuce-unspecified	32	lettuce/PDP/94	691	2	27	0.005-0.16	0.002478	0.00136
mushrooms	100	field trial data	13	na	13	0.07-0.17	---	0.121
mustard green	1	collards+kale+mustard green/ FDA/92-98	355	0	7	0.005-0.83	0.0015	0.0021
nectarines	70	peach-fresh/PDP/94-96	1087	366	65	0.003-0.16	0.003269	0.003

Commodity	%CT <sup>2</sup> (Avg)	SUMMARY OF DATA <sup>3</sup>						Point Estimate (PPM)
		commodity/source/ysrs	Total	Imp	Det	Range (det)	½ LOD (avg)	Chronic
onions-dry	11	dry-bulb onions/FDA/92-98	248	0	2	0.005-0.01	0.0015	0.00021
onions-green	8	green onions/FDA/92-98	100	0	0	na	0.0015	0.00012
orange-juice	39	orange-juice/PDP/97-98	1392	532	0	na	0.003684	0.00144
oranges	1	oranges/PDP/94-96	1892	23	0	na	0.003091	0.000031
orange-peel	1	use citrus tolerance (0.7 ppm)	--	--	--	--	--	0.007
other caneberries <sup>4</sup>	45	blackberry + raspberry/FDA/92-98	192	0	3	0.0005-0.033	0.0015	0.00024
other citrus peel <sup>5</sup>	1	used citrus tolerance (0.7 ppm)	--	--	--	--	--	0.007
other citrus	1	orange/PDP/94-96	1892	23	0	na	0.003091	0.000031
parsley	4	spinach/PDP/95-97	1638	46	41	0.003-0.45	0.003645	0.000328
parsnips	100	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	0.00591
peach (fresh, cooked, dried, juice)	42	peach-fresh/PDP/94-96	1087	366	65	0.003-0.16	0.003269	0.0021
peach (canned/frozen)	12	peach-can/PDP/97	754	11	0	na	0.003471	0.000416
pear (fruit & juice)	24	pear/PDP/96-98	1420	217	37	0.003-0.094	0.003	0.001068
pepper-chilli, jalapeno	1	green pepper/FDA/92-98	397	---	8	0.005-0.251	0.0015	0.00086
pepper-green, other & pimiento	8	green pepper/FDA/92-98	397	---	8	0.01-0.05	0.0015	0.0017
pineapples	100	field trial data	na	na	15	0.011-0.082	---	0.035
plums	39	plums/FDA/92-98	112	0	0	na	0.0015	0.000585
potato	1	potatoes/PDP/94-95	1401	---	0	-----	0.0023	0.000023
radicchio	100	lettuce/PDP/94	691	2	27	0.005-0.16	0.002478	0.00031
radishes-oriental	100	radish-root & oriental/FDA/92-98	142	---	1	0.038	0.0015	0.00176
radishes-roots	4	radish-root/FDA/92-98	121	0	1	0.038	0.0015	0.0003636
raspberry	25	raspberry/FDA/92-98	139	0	2	0.005-0.033	0.0015	0.000630
rutabagas	100	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	0.00591
sheep-fat	37	dermal treatment studies						2.2
sheep-kidney	37	dermal treatment studies						0.45
sheep-lean	37	dermal treatment studies						0.13
sheep-liver	37	dermal treatment studies						0.005
sheep-meat byproducts	37	dermal treatment studies						0.45
sheep-other organ meats	37	dermal treatment studies						0.45

Commodity	%CT <sup>2</sup> (Avg)	SUMMARY OF DATA <sup>3</sup>						Point Estimate (PPM)
		commodity/source/years	Total	Imp	Det	Range (det)	½ LOD (avg)	
sorghum	1	wheat/PDP/95-97	1563	---	24	---	0.0032	Chronic
spinach-canned	24	spinach-can/PDP/97-98	863	1	0	na	0.003978	0.000955
spinach-fresh	22	spinach-fresh/PDP/95-97	1638	46	41	0.003-0.45	0.003645	0.0018
squash-summer	4	summer squash/FDA/92-98	514	0	1	0.11	0.0015	0.00027
squash-winter	39	winter squash/PDP/97-98	969	349	2	0.003-0.007	0.0025	0.0006
strawberries	9	strawberries/PDP/98	610	----	9	0.003-0.03	0.0034	0.00039
sugar beets/molasses	2	beets-garden-roots/FDA/92-98	166	0	0	na	0.0015	0.00003
sweet corn	9	sweet corn/FDA/92-98	793	---	3	0.005-0.049	0.0015	0.0002
sweet corn-canned	9	sweet corn-can/PDP/94-96	652	---	0	---	0.0021	0.00019
sweet corn-frozen	9	sweet corn-frozen/PDP/94-96	635	---	0	---	0.0021	0.000019
sweet peas-canned	1	sweet peas-fresh/FDA/94-96	746	---	0	----	0.0026	0.000024
sweet peas-fresh	4	sweet peas-fresh/FDA/92-98	540	0	13	0.01-0.81	0.0015	0.0022
sweet peas-frozen	1	sweet peas-frozen/PDP/94-96	703	---	10	0.005-0.049	0.0025	0.000246
sweet potato	9	sweet potato/PDP/96-98	1558	---	3	----	0.0023	0.00021
Swiss chard	100	celery/PDP/93-94	810	15	64	0.005-0.3	0.0028	0.00417
tomato (fresh/dried)	36	tomato/PDP/96-98	1597	533	10	0.003-0.09	0.0026	0.00103
tomato (processed)	9	tomato/PDP/96-98	1597	----	10	0.003-0.09	0.0026	0.000327
turnip-roots	100	carrots/PDP/94-96	1887	98	68	0.003-0.086	0.00324	0.00591
turnip-tops	100	spinach-fresh/PDP/95-97	1638	46	41	0.003-0.45	0.003645	0.008215
walnuts	7	field trial data	na	na	---	<0.01	0.005	0.00035
watercress	100	field trial data	na	na	1	0.025	---	0.025
watermelon	2	watermelon/FDA/92-98	415	0	1	0.002	0.0015	0.00003

1. DEEM inputs for chronic analysis were based on average residues in composite samples adjusted for percent crop treated. Each commodity, the assumptions and detailed procedures for estimation of inputs is listed in the following sections, according to crop groups.

2. Percent crop treated (%CT) is based on the average %CT as reported in the attached BEAD report of 1/29/99. For those instances in which the source data contained a significant contribution of imported samples, the %CT was adjusted by assuming that 100% of all imported samples had been treated. If the usage data were not available for a crop, then 100% CT was assumed. If less than 1%CT was reported, then a minimum of 1%CT was assumed.

3. Total=total samples reported; Imp=number of imported samples reported; Det=number of samples containing residues of diazinon greater than the appropriate limit of detection of the analysis; ½ LOD=the average of ½ the limits of detection for samples analyzed, which is an estimate of the residue level in samples assumed to originate from crops that had been treated but contained non-detectable residues.

4. Other caneberries include boysenberries, dewberries, loganberries, and youngberries.

5. Other citrus include lemons, limes, tangerines, tangelos, kumquats, and citron.